

**ABSTRACT**

An optical signal transmission device for transmitting phase information of optical signals is provided. The device includes a multiplexing formatted optical signal generator arranged to generate multiplexing formatted optical signals. The device also includes an optical phase generator  
5 arranged to receive the multiplexing formatted optical signals. An optical information transmission method for transmitting optical signal information including phase information is also provided. The method includes receiving multiplexing formatted optical signals generated by a multiplexing formatted optical signal generator at an optical phase  
10 generator. The method also includes phase conjugating the multiplexing formatted optical signals by means of four wave mixing (FWM).